MUSEUM STORIES FOR CHILDREN

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The James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures

FIELD MUSEUM OF NATURAL HISTORY

Series XXVI, Number 1
March 7, 1936

90715

FIELD MUSEUM OF NATURAL HISTORY
Roosevelt Road and Lake Michigan
CHICAGO

THE CATTLE FAMILY

The word "cattle" from the old French word "catel" or "chattel" formerly meant a person's property. At the time of the writing of the Bible any domesticated animal was classed as cattle. Today, the use of the word is limited to members of the ox, cow or buffalo family—animals which gather food rapidly and later chew it in cud form.

The fossil bones of early types of cattle found in Asia and Europe show some of them to have been huge beasts with enormous horns, while others were humped or of slender and delicate build. On the wall of a cavern in France are pictured two kinds of bison. One is of a type no longer living; the other is like the bison we know. Another cave has a group of bison modelled in clay. In English and Danish peat bogs have been found skulls of the aurochs, as the ancient forest ox was called. Some have the flint axes of the hunters imbedded in the foreheads. The oldest cattle fossils are found in India.

Cattle have always been of importance to man. The magnificent sculptures on the walls of temples and palaces built by the old kings of the Tigris-Euphrates and Nile River valleys show oxen plowing fields, pulling carts or threshing out grain by tramping upon it—a method still used in various parts of the orient and by some of the Indians living in the southwestern part of our own land. On ancient Egyptian papyrus records may be seen pictures of long and short horned and humped cattle, while numerous statues of sacred bulls and cows have been discovered in tombs and temples. In the far east, cattle are still worshipped. Often gorgeous trappings and jewels decorate the sacred animals used in religious processions.

During the Middle Ages, kings and nobles hunted the aurochs, an animal of tremendous strength and ferocious temper. In some old inns, castles and churches dating back to that time may still be seen drinking cups made of the aurochs' horns beautifully set in silver. Such cups are highly prized today as the aurochs has been extinct for several hundred years.

At the present time, wild oxen related to domesticated kinds, are found in small numbers in Asia, Africa and Europe. India has the famous gaur or seladang which is considered the finest of all living wild oxen. In spite of its huge size and weight, it can scale rocky surfaces with ease, and as far as known has never been domesticated. The water buffalo and the single or double-humped zebus have been domesticated. From the first named has been developed the carabao

of the Philippine Islands, a valuable animal in the rice terraces and for travel through the rugged lands of those islands. The zebus are odd animals with voices more like pig grunts than cattle lows. They are used as beasts of burden, for riding and for supplying beef wherever raised. Pure white zebus of India are sacred to Siva and must not be worked or be teased in any way.

The short-legged, long-haired domestic yaks of Tibet and Siberia can safely cross the most difficult mountain passes with heavy loads upon their backs. As they need little food, and sleep contentedly upon glacier or snow beds, they are very useful in those wind swept countries. The wild yaks are dangerous animals living in the highest mountain plateaus and like the African buffaloes cannot be tamed. The latter are regarded by big game hunters as among the most dangerous of all wild beasts. The smallest of the ox-like ruminants is the anoa found on the Island of Celebes. This pigmy buffalo is only three feet high at the shoulders, is exceedingly shy and difficult to see as it lives in the woods.

Our own land can no longer claim any wild cattle. The few buffaloes that remain are protected and live upon preserves. But we have numerous kinds of domestic cattle. Some are used in mountainous regions in place of mules and horses; the famous beef-producing Herefords and Shorthorns range over the great ranches of the west, and many sections of the United States have become noted for their herds of dairy cattle. Among the best of the milk-givers are the Jerseys and Guernseys from the Channel Islands and the Holsteins from Holland. In some areas the Brown Swiss is the favored cow.

All provide the excellent milk and rich cream so important as food to all of us. Butter and cheeses, meat and leather—all from the animals known as cattle—have become so necessary a part of our lives that we should miss them greatly were they no longer to be had.

MARGARET M. CORNELL, Guide-lecturer

Note: In Halls 17, 22, G and H are exhibits illustrating various types of cattle of foreign lands. Hall 16 shows the American bison. In Hall 32, are two Tibetan drinking cups made from yak horns.

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STEPHEN C. SIMMS, Director

MUSEUM STORIES FOR CHILDREN

FIELD MUSEUM OF NATURAL HISTORY

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FIELD MUSEUM OF NATURAL HISTORY
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CHICAGO

THE STORY OF FLAX

The story of flax and its uses begins far back in prehistoric times before man had learned to write or keep historical records. As wild flax is still found growing in southern and western Europe, in northern Africa and western Asia, it could have been first domesticated in any of those regions. There is no way of knowing what people first used it, or for what purpose.

We do know that the Swiss Lake Dwellers used flax of an excellent kind. Bits of woven materials—some water proofed by the addition of fibers of another kind—have been found in the ruins of some of the villages. In others have been found hanks of yarn ready to weave, spindles with their clay whorls and flax fishlines and nets. The remnants of materials show the Lake Dwellers to have had a thorough knowledge of combing and twisting the fibers as well as of weaving and tying.

The ancient Egyptians took great pride in their looms and linen cloth. So well was the material made that many of the mummy wrappings are still in perfect condition. In some way, the Egyptians were able to twist the flaxen strands more tightly than we can with our modern machinery. As a result, some of the linen found in tombs and temples has more threads to the square inch than any we produce.

When the Romans settled in England, they grew the flax plants in their adopted homeland and established a linen factory at Winchester. But it was some time before the Britains used it. King Henry VIII sought to compel the people to raise it and passed a law saying every farmer must grow "1 rood of flax to every acre of land cultivated." For many years afterward, those failing to do so were punished or made to pay a fine.

Belgium and Ireland rank highest among flax producing countries today. When the fearless Phoenicians first landed upon the shores of Ireland, they discovered rich deposits of tin. Gradually, many Phoenicians made their homes on the green island and soon flax was growing in several settlements inhabited by miners. That was over two thousand years ago, but not until the twelfth century did the raising of flax become an important Irish industry. Since that time, the island has refused to produce any except the best flax and thus has won a great name for itself, for the quality of linen made.

Flax is not an easy plant to grow. It must be sown in deep, sandy loam which has been very carefully cleaned. If the flax is grown for

its seeds—as in the United States—the plants are allowed to have many branches. A blossoming flax plant is beautiful when in bloom. The branches have many clusters of dainty, blue flowers which later produce the small, flat, polished seeds. These give the linseed oil so valuable in the making of paints, linoleum, printer's ink, soaps and medicine.

When flax is grown for its fibers, the seeds are sown close together that stalk and not branches may be developed. The stalks will then be straight and slender and often as much as 40 inches high. Such plants demand careful handling, lest the stems be broken. All weeding and pulling must be done by hand, as a sharp knife would cut the fibers straight across making them hard to spin into thread.

After pulling, the plants are put into bundles which are stood up against each other in "stooks" which are 8 to 10 feet long, until ready to be "retted." This soaking in water loosens the plant gum which binds the fibers to the core of the stem, and the stems are then passed between rollers to break up the woody parts. After the "scutcher" has drawn the stems across wooden bars the clean, straight fibers come free and are ready to be combed, twisted and woven into threads, yarn or cloth.

A flax fiber is round and of a clear, clean outline so that dust has no place to collect. Disease germs do not like flax and moths will not touch it. This and the fact that the fibers are so long and among the strongest plant fibers grown, makes flax one of the most valuable fibers known to man. It is used in hospitals, in homes and in industry. Among the best products are aeroplane cloth, canvas for tents, duck, tarpaulins and other fabrics needing great strength.

MARGARET M. CORNELL, Guide-lecturer

Note: In Hall 28 may be seen many kinds of flax both in the rough and finished stages, a box of the flat, shiny seeds, and thread and cloth made from the fibers. Hall J has several cases showing Egyptian uses of linen. In Hall F are Maori garments made of wild flax, and Hall C contains bits of linen cloth and fish nets made by the Swiss Lake Dwellers.

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FIELD MUSEUM OF NATURAL HISTORY

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FIELD MUSEUM OF NATURAL HISTORY
Roosevelt Road and Lake Michigan
CHICAGO

THE STORY OF MESA VERDE

Mesa Verde National Park is one of our most interesting historical areas.

This park is 15 miles long and 8 miles wide, covering a section of 48,966 acres in southwestern Colorado. From Park Point may be seen portions of Utah, Arizona and New Mexico as well as the surrounding neighborhood. When the Spanish first entered the region they were thrilled with its masses of tall spruces, cedars and piñon pines and gave it the name, "Mesa Verde" meaning "green table."

It is a land of strange, weird beauty. Deep, jagged canyons extend back into the sides of high mesas. Long ago, waters flowing through the canyons cut out caverns in the coal, shale and sandstone walls of the cliffs, leaving rock-roofed caves. Within some of the cavities thus made have been found the most magnificent ruins of cliff dwellings to be seen in the United States.

The archaeologists—people who study ruins and the things found in ruins—tell us that as long ago as 500 B.C. some farmer Indians used the cavern now occupied by the ruin known as Cliff Palace. Whether those Indians staid for a long or short time is unknown. Deep down in the covering of the floor was discovered a yucca fiber sandal such as was worn only by the first farmers of our land. About the time of Christ, a second group of farmer Indians had reached the area and they built homes in the sandy floors of some of the caves and in the red soil of the low mesas between the canyons. They made baskets, wove fibers into beautiful materials, and are thought to be the first people of the southwest to fire their pottery. How long this second group of farmers staid at Mesa Verde, or why they left, we cannot tell.

Next came the Cliff Dwellers. By comparing the annual rings of a piece of wooden beam found in one of their dwellings, now called the "Jug House," with others of more recent times, we find that they were living there in A.D. 1066. That is more than four hundred years before Columbus came to the western hemisphere. Yet, so well did they build within the caverns that it is possible to study their history from the ruined dwellings, sacred kivas and things found within them.

The Cliff Dwellers must have numbered many hundreds of people. Spruce Tree House alone could have cared for 350 with its 114 rooms, including those used for storage and burials. Another huge dwelling was Cliff Palace which had so many rooms they extended down the

canyon side and were held in place with retaining walls. It also had a round tower built of skilfully cut and fitted stones covered with a fine plaster. This tower may have been for religious purposes, but the number of small peepholes would lead one to think it was a look-out. From the openings, one can see far down the canyon. Balcony House is one of the most picturesque dwellings. Its upper rooms had beams projecting beyond the walls. On these were laid poles covered with bark and clay. Thus was formed a porch or balcony for the use of the inhabitants.

Most of the kivas or sacred structures were built close to the living rooms, but some were set back from the cliff edges, yet in full view of the cliff houses. The famous Sun Temple was an enormous building in the shape of a capital D and contained many objects showing the people to have worshipped the sun. This is considered the finest bit of Mesa Verde architecture. The Fire Temple containing a circular-walled fire pit in the center of a hard, adobe floor seems to have been the place where new fires were kindled. Fire symbols and numerous pictures of mountain sheep and other animals were discovered upon the walls.

Only an extremely industrious people could have developed such a community. They built hundreds of dams to save the melted snows for summer use; they led spring waters where most needed, and raised corn, beans and gourds on the half-dry mesas. Their decorated cloth and pottery show them to have been artists of the highest type.

It is strange that such a people should have passed from the region and no record of their going be found. Perhaps, the great drought which began in 1276 and lasted until 1299 drove them to seek less arid parts of the southwest. As objects much like those found in Mesa Verde have been uncovered in Utah, Arizona and New Mexico, they may have gone there. Some believe the pueblo people are related to them.

MARGARET M. CORNELL, Guide-lecturer

Note: In Hall 7 are models of cliff dwellings, many objects found in Arizona and Utah cliffs, and an exhibit showing how dates are determined from yearly tree rings.

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CHICAGO

EARTHQUAKES

When this old earth on which we live finds it necessary to make some changes in her rock blanket, or to rebalance the weight of piled up materials on the crust, she treats us to what is commonly called an "earthquake." Usually, the shiftings are made with little or no visible destruction of lives or property. At other times, the havoc caused may be very great.

Only in recent times, have the scientists found the real causes of earthquakes and been able to construct instruments for locating their centers and measuring their power. Before that many strange ideas were held by peoples of various lands.

Some thought the quakes were punishments sent by angry gods; others so feared the results of earthquakes that they built temples in which they worshipped and made offerings to a god of earthquakes. In many lands, it was thought that the pushing up of the earth's surface and the rumbling sound that sometimes accompanied it were caused by a huge monster moving about below the surface. The form of the monster varied. In Japan, it was either a great spider or a giant catfish; in Mongolia, a hog. India thought the great cracks were made by a giant mole working in the ground.

Earthquakes are the most terrifying of all the earth's activities. To see the ground on which one is standing suddenly rise and fall like the waves of the sea, or the water in a nearby pond disappear into the earth is not a pleasant experience. And when the earth opens and whole villages sink from view, we do not wonder that ancient peoples looked upon earthquakes with horror.

The causes of the earth tremors lie in the fact that this earth is not a solid, rigid ball, as so many think, but a mixture of movable and elastic matter. Below the crust, the mineral mass seems to be in immense blocks which are constantly bending, slipping or breaking. If they break, the sudden jarring produces tremblings which are earthquakes; if part of an old break slips on the other part, the movement causes a vibration or earthquake. The majority of earthquakes are caused in this manner. Then other kinds of strains and squeezings may break rocks and cause quakes. The mass above the earth's core, which is 4,000 miles across and extremely hot, is constantly being changed.

When high lands are worn down by the action of wind, frost and water, the detached material collects in the valleys near or is carried

by the rivers to the sea. There it is dumped on the ocean floor or on the shelves next to the coast. Like any other substance, the earth's crust can stand just so much weight without bending or breaking. When too great a weight overloads the crust in one place the crust sinks and some other area will be pushed up. The roofs of caves may collapse and leave deep pits; cracks on the sides of volcanoes may open and let out hot lava, or waters may be drawn down, heated and then pushed forth again as steam. That happened last year at Quetta in Baluchistan when boiling blue mud flowed from new splits on the sides of a hill, during one of the worst earthquakes in recent years.

Sometimes, the waves of movement caused by the earth's attempt to shift the weight will travel some distance and push up land to get a balance. The ocean floor may be pushed to such an extent that mountains previously formed there may become islands of the sea. The islands off the Asia and Alaska coasts were formed in this way.

An average of 15 earthquakes occur each day. Some areas, like the Appalachian and Scandinavian, have been in the present form for ages, so seldom have any shocks. Other regions have frequent shocks, many of very destructive character. The largest number occur in the belt extending from the Mediterranean Sea to the East Indies. Another large belt is that which includes Japan, Alaska, California, Mexico, Central America and the Andes region of South America.

Many areas that formerly had great loss of homes during quakes are now building cement houses with steel framework which bends with the earthquake movement but does not break. In other regions structures are tied together for the same purpose. The invention of the seismograph and the location of these instruments in important areas throughout the world has made the study of earthquakes possible. The more the scientists can find out about them and their movements, the better equipped can man become to withstand their shocks.

MARGARET M. CORNELL, Guide-lecturer

Note: In Hall 35 on the second floor may be seen pieces of rock showing faults made by earth movements, cracks filled with nature's cement and rocks that show the scratches made when one piece slips by another.

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FIELD MUSEUM OF NATURAL HISTORY
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INDIAN BOWS AND ARROWS

Bows and arrows have been used by hunters and warriors for such a long time that no one knows what people first made these weapons or how and when it happened. Arrowheads have been found in Spain; these were, no doubt, made by prehistoric people at least 10,000 years ago. Only hard arrowheads have been found. The arrowshafts and bows were probably made of wood and so of course have disappeared. However, some of the paintings on the walls of the caves used by these people show pictures of men carrying bows and arrows.

In the new world most of the Indians and Eskimos used bows and arrows. As early as A.D. 500, the Cliff Dwellers in the southwest made arrows tipped with obsidian and simple bows. Indians of later times really perfected the bow until it was a prized possession, and the arrows were discharged with skill and speed.

From the time an Indian boy could walk he practised with his bow and arrow. He learned the art of making a good bow and perfect arrows. The Indians used whatever wood they could find in their own regions for their bows and shafts; thus the materials varied among the different tribes. Hickory, ash, hornbeam, osage orange, willow, juniper, spruce, cedar and yew were all used for bow making.

Most of the North American Indian bows were self-bows, that is, each bow was made of a single piece of wood. Usually the wood was oiled and then bent into shape by holding the wood over live coals and pressing with the foot. If the wood was not very strong or elastic the bow was strengthened by a piece of sinew glued along the back and wrapped around the bow.

Among some of the Indians and Eskimos wood was so scarce that pieces of bone, horn or driftwood were carefully fitted together into a bow. This compound bow had to be strengthened by cords of sinew along the back. Wet sinew threads were bound around the entire length of the bow. As the sinew threads dried they tightened and the finished bow was a strong, tough weapon. It lasted as long as it was given good care and kept dry. The bow string was made of twisted sinew, usually of the buffalo or elk.

The North American Indian bows were not large, heavy weapons. An effective bow must not be any stronger or larger than can be conveniently used by the person. The Plains Indians especially used the bows and arrows while riding on horseback; thus they always used the small ones which could be easily carried. In the early days in

England the soldiers who marched afoot could manage huge six foot bows—but not so the Indians.

There is probably a greater variety of arrows than bows. Some of the earliest arrows were single, straight shafts; one end was sharpened and then hardened in the fire and the other end was notched. One, two or three feathers were attached to steady the arrow. The important fact about the arrow was that it must be straight and stiff. Willow, ash or dogwood saplings made good Indian arrows. The arrow was whittled to the proper size, smoothed down with sandstone and usually allowed to season over the fire. An arrow used in hunting needed a strong, sharp point; thus arrowheads were made of flint, quartzite, obsidian, bone, antler, copper and later iron and steel. The arrowhead was carefully lashed to the shaft with sinew. Certain people within each tribe made the arrowheads for the whole group of Indians.

As time went on the arrows became more complicated in structure. Each Indian marked his own arrows in such a way that he could claim the deer, buffalo or any animal killed by his own arrow.

There are very few parts of the world where the bow and arrow has not been used at some time or other. Natives of Australia and Tasmania do not seem ever to have used this weapon. It has not been used in Peru, but otherwise the bow and arrow is the oldest and most widely distributed of the projectile weapons.

As a weapon for war and the chase these bows and arrows have been replaced by firearms in most parts of the world. However, among the most primitive of the Eskimos and in certain parts of Africa and Melanesia the bow and arrow still has an important place.

In other sections of the civilized world the bow and arrow is not forgotten. Archery has become an amusing sport wherein skill plays an important part.

MIRIAM WOOD, Guide-lecturer

Note: A number of bows and arrows may be seen among the North American Indian exhibits in Halls 4, 5, 6, 7 and 10. Notice in particular the sinew-backed bows and obsidian-tipped arrows in Hall 6, Case 4. Interesting compound bows are in Hall 10, Case 38.

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FIELD MUSEUM OF NATURAL HISTORY

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FIELD MUSEUM OF NATURAL HISTORY
Roosevelt Road and Lake Michigan
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TROPICAL FRUITS

Many people living in northern countries and unfamiliar with the tropics, believe that fruit trees flourish all through these hot lands; they think that any person may practically help himself to a wide variety of luscious, exotic fruits by simply reaching out and picking them from the trees.

It seems a shame to spoil such a pleasant myth but in its place another story will make these fruits seem more truly valuable to us.

In the first place, fruit trees are not to be found everywhere in the tropics. It is true that in some places soil and climate both make for rapid growth of plants and trees. However, the fruits produced in a wild state are not always particularly good to eat. To produce fruits of the finest quality, selected trees must be cared for and cultivated through many years. The same tropical heat that makes these trees grow takes the energy and ambition of the people; they do not always bother to plant and cultivate anything for their own use. As a result, sometimes only a few neglected trees can be seen in the villages away from the plantations and there is often a shortage of edible fruits for the people.

Bananas are the commonest of all tropical fruits. They have been cultivated in the eastern tropics for thousands of years and in many other regions for centuries. There is now scarcely a hut in the tropics without its banana plants. Great plantations have been developed for export trade in bananas and these fruits have become important food articles in all markets.

For many years the Arabs have respected and honored the date palms. These stately trees furnish shelter and fruits for thousands of people in Egypt, Arabia, Persia and India. They have used these fruits since before the time of recorded history. So important are the dates to the Arabs that they can live for months with nothing more than dates and milk for food.

The mango of India has been called "the king of fruits." It is noted for its spicy flavor and attractive appearance. These fruits have been cultivated for at least 4,000 years. Definite record is left that the Emperor of India in the late fourteenth century had an orchard of 100,000 mango trees. Today the fruits are really more important to the many people in the tropics than apples are to people in our northern regions.

In the last few years avocados, popularly called "alligator pears," have become fairly common in the northern cities. The natives of Central America have prized these fruits and cultivated them for many years. There is more actual food in an avocado than in most fresh fruits. For instance, it has far more oil than any other fresh fruit. One avocado with four or five tortillas (corn cakes) makes a complete meal for a native Indian in Guatemala.

Probably one of the most common tropical fruits used in this country is the pineapple. The Spaniards found pineapples growing wild in the American tropics many years ago; they thought the fruits resembled the fruit of a pine and so they were first called "pinas."

The guava trees grow with as little care as any tropical trees. In fact they grow so readily that they are almost pests in some places. The fruits can be used in a number of ways; they are eaten raw as we eat apples or they are cooked. More often the guavas are made into jelly—guava jelly is becoming widely known.

Hawaiian people eat papayas in place of melons for breakfast. The papaya grows on a large plant from fifteen to twenty-five feet high. The plants start bearing fruits when a little over a year old and live for just a few years. However, in that short life one plant will produce over one hundred huge fruits.

Visitors to the tropics also become acquainted with the pomegranate, granadilla, cherimoya, sapodilla, breadfruit, mangosteen, durian and countless others not so well known.

Many tropical fruits appeal only to those people who are accustomed to them and have perhaps learned to like them. The natives naturally use most of the fruits if they can get them. As the fruits are brought into the markets the people crowd around the loaded donkeys and burros; they make their bargains and then stop to gossip. The fruit markets take the place of a daily newspaper.

MIRIAM WOOD, Guide-lecturer

Note: In Hall 28 you may see the banana, date, mango, avocado, pineapple, guava, papaya, granadilla, sapodilla, breadfruit, mangosteen, pomegranate and several other tropical fruits. In Hall 17 you may see a durian tree in which a group of orangs have made their home.

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FERNS

Among the millions of plants in the world, those whose leaves stand out for their infinite variety of form and beauty are the ferns. Other plants may be radiant and dazzling with brilliant or delicate blossoms—but only for a short time. The ferns have no blossoms; their leaves are the entire display and this beauty is not short-lived. Some ferns are so small as to be overlooked; they are like tiny mosses. In comparison, the tree ferns in the tropics often reach a height of seventy or eighty feet.

Ferns are not limited as to their place of growth. They can be found in the far north, even within the arctic circle. Many of these plants thrive on the mountain tops or on rocky crags. Some live in the water. They are found all through the temperate zones but they reach their most luxuriant growth in the moist, hot tropics.

Some ferns are erect plants—either short or tall; others cannot stand alone and seek support by climbing around tree trunks. Still others live in the tree tops getting their food from the air and the trees and draping themselves gracefully in the branches. Florida is famous for its so-called epiphytic ferns.

Ferns do not have true seeds as do many plants; they have spores instead. The spores are so small that they look like fine powder. They appear in little, dark patches on the under side of fern leaves or they are borne on separate stems. Each minute spore has the power of developing, under proper conditions, into a small leaf-like object which in turn produces the part of the plant we know and call the "fern." Of our common ferns the roots are rather small and are like fibers. The stem grows under or along the ground and is often called a root. The leaf fronds shoot up from this under-ground stem.

Millions of years ago the ferns were much more abundant than they are now. They were the most dominant of all the plants. The earliest ferns lived around 500,000,000 years ago and were probably simple, small plants; but they developed in form and size until in the Carboniferous Age, about 250,000,000 years ago, they reached their greatest development and were most plentiful. They grew rapidly in the moist, hot swamps. As they died they toppled over and gradually sunk downward into the oozy mass. A great amount of ferns and other plant material accumulated in those swamps; as a result of the heat and pressure for many years on this submerged plant material, it has formed coal.

We have a number of common ferns in this region. The ones most often seen are the bracken fern and the Christmas fern. The bracken fern is more complexly branched and makes a good specimen for studying the intricate pattern of a fern leaf. One of the loveliest ferns in this region is the maidenhair fern; it is easily recognized by the delicate leaflets and the wiry, dark stem and midribs. Some ferns are not so quickly identified; in fact they can be distinguished only by studying the spores and how they are borne on the leaves or stems.

Ferns are not merely ornamental; a few furnish useful materials. In Central America and elsewhere some of the tree ferns have very strong trunks. The wood is practically resistant to decay and to attacks of termites. Many houses are built of this tree fern wood. The scales and fibers of the fern stems in Honduras are used in stuffing pillows. Most of their pillows are made in such a fashion. In the Philippine Islands the large fibrous roots of the tree ferns are made into brooms. The natives weave baskets and mats from the slender strands of the climbing ferns. The male fern has spores that pop like miniature fire-crackers; these spores are occasionally used in fireworks.

Other ferns may not be important for practical purposes of any kind, but do have unusual and interesting characteristics. For instance, the bird's nest fern in the tropics has fronds which grow and curl around into a perfect nest. Then there is the walking fern which has a way all its own for traveling. The leaf of this fern is rather long and tapers gradually to a point; this point droops to the ground, takes root and a new plant shoots up. The new plant sends out leaves which do their part in this peculiar way of walking.

We might say then that ferns are found all over the world, are many in number, great in variety and have several uses. However, in our part of the country ferns are mainly ornamental.

MIRIAM WOOD, Guide-lecturer

Note: The early ferns may be seen in the swamp forest reproduction in Hall 38 and in detail in Hall 29. Ferns of the present day may be seen in Hall 29 also. Brooms and baskets made from ferns will be found in Hall 28.

Save your Museum Stories. You will find them useful for looking up things you may want to know.

The open hours are as follows:

Nov., Dec., Jan., Feb., Mar. - -	9 A.M. to 4:30 P.M.
Sundays, Nov. 1 Mar. 31 - - -	9 A.M. to 5:00 P.M.
April, September, October - - -	9 A.M. to 5:00 P.M.
May, June, July, August - - -	9 A.M. to 6:00 P.M.

Field Museum is free to children at all times.
It is free to adults on Thursdays, Saturdays and Sundays.

STEPHEN C. SIMMS, Director

MUSEUM STORIES FOR CHILDREN

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THE GRASSHOPPER FAMILY

Few insects are better known than the grasshoppers. These famous leapers of the insect family can trace their ancestry back to the age of the early dinosaurs and toothed birds. Today, they are found all over the earth. Even the arctic region has its hoppers.

Like their cousins, the cockroaches and crickets, they vary in size, shape and color according to the areas in which they live. One group consists of those grasshoppers, which, like our common red-legged field hopper (when winged), have ears on the first segment of the abdomen, short antennae, and make music by rubbing the hind legs against the wings. The other group has ears on the front knees, very long antennae, and one wing is drawn against the other in making the shrill sound called "singing." The meadow green grasshopper and the katydid belong to this second division.

With the exception of a group of very tiny grasshoppers which hibernate, the hoppers have short lives. The eggs hatch in the spring into "nymphs." These look exactly like their parents—except they show no wings—and have enormous appetites. After the fifth moulting of the skin, the wings appear and the insects are then grown-ups ready for a few weeks of leaping, flying and egg-laying. Sometimes, the eggs are placed in old wood; sometimes, in holes in the ground. They are covered with a frothy material which protects them during the long winter months, or from too much moisture. As soon as the eggs have been deposited the adults die. But during that short life, great damage may have been done to growing crops.

The extremely long, strong hind legs are most noticeable. When at rest, or in walking, the knee joints are much higher than the back of the body. When about to leap, the entire spiked back foot rests on the ground, then, like a spring let loose, the grasshopper bounds forward. If you could jump the same distance in proportion to your size, you would leap up 300 feet. Even when wingless, these wonderful legs and the notched mandibles, which take hold like a pair of nippers, have made it possible for some kinds of hoppers to gather in masses and descend upon an area and completely destroy every green leaf in a few hours. Africa, Asia and the western part of our own country have suffered great losses from such invasions of grasshoppers, or locusts, as they are frequently called. However, not many kinds are so destructive. Some are beneficial.

Boys and girls in the states to the east and south of us, sometimes, see the leaf-rolling grasshoppers. These make no sound and are wing-

less. They spend the daytime in nests made by rolling leaves and fastening the edges with silk spun from their mouths. At night, they come out and feed upon aphids, those little rascals that cause so much injury to our rose bushes.

The so-called "cave crickets" found in dark, moist places in woods, cellars, wells and caves are really grasshoppers. They too are wingless, as are the mother shield-backed hoppers found in the grassy fields and open roads. Look carefully to see the sunbonnet shaped shield that extends backward over the neck and gives the name. These hoppers remind one of tiny toads as they hop from one place to another. In searching for hoppers do not forget that some of them live in the treetops, as well as in the fields and along roadsides. The long-winged, cone-headed grasshoppers like the leafy boughs.

In our land thousands of sheep, cattle and hogs are used each year as food. We look upon meat as a necessary food, yet there are lands where the people never taste such meat. Perhaps, their animals are so scarce they are used only as burden carriers, or are sacred. In some regions no animals are raised, and other things must take the place of meat food. In such lands insects are often important.

Many of the oriental countries have looked upon locusts as a valuable food since ancient times. In Arabia, Persia and Egypt, grasshoppers are roasted and are considered a great delicacy. Food is scarce in many parts of South Africa, hence a flight of grasshoppers is looked upon as a blessing. It is said that after a hopper feast, the Hottentots are much fatter than before, and in the Belgian Congo whole villages go to the grasslands and catch the hoppers that rise in fishnets.

Thus, the grasshopper family may be looked upon with terror in one region, and with grateful thanks to the spirits that sent them in some other region.

MARGARET M. CORNELL, Guide-lecturer

Note: In Hall 18 may be seen grasshoppers of the dune region near Chicago; in Hall 38 is a cast of a six-inch long fossil grasshopper found in Bavaria, in the Jurassic limestone; also in the same hall, may be seen a forerunner of the grasshopper group, on the front log of the Carboniferous Case.

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